

which future generations, if not our own, will see, fruitful with the olive and the vine, blessed as the beautiful home of a prosperous and happy people.

I feel, gentlemen, that I owe the Society an apology for this long and discursive paper, one, too, in which I fear the professed geologist will find but little that is new. My object, however, has been to indicate where enquiries can be made, rather than to offer any very profound theories or very novel facts. I have long felt that the particular science, the claims of which I advocate, has been too much neglected in this colony. That profit and pleasure are to be derived from its study is what I have sought to show. Its use must be patent to every one who looks upon our own as a mining or an agricultural country. When a Victorian Miller or Mantell shall arise amongst us, such individual need be at no loss to find materials for a work quite as interesting as the *Old Red Sandstone*, or the *Medals of Creation*. Such a treatise may have all the charms of an imaginative work without departing from the strict line of geologic fact. But until this comes we need not be idle, nor on this subject need we be dull. Our stony treasures are as great as those of other lands. The story of our rocks and of our fossils is well worth listening to, or even digging out if requisite. The field is a rich and an ample one. He who toils in it enthusiastically and with a will, need not toil in vain, for of it may be said, "The harvest is indeed plenteous, though the labourers are few."

ART. II.—*On the Probable Erosion of the Mountain Ranges of Gipps Land.* By THOMAS E. RAWLINSON, ESQ., C.E.

[Read 3rd July, 1865.]

Having had occasion during the latter half of the years 1862, 1863, and beginning of 1864, to travel over the country lying between Sale and Jericho, in various directions, my attention has been directed to the peculiar character of the mountain fastnesses of that region, and also to some extent to the mountain ranges extending northerly from Sale, as a centre, up into the Omeo country.

It is not my purpose to do more to-night, than allude generally to the similar external character of the Omeo routes with those of the country traversed by the tracts to

the Jordan. I may remark, however, in passing, that in both localities we have large tracts of country traversed and interlaced, by a net-work of ridges and ravines, of a most impracticable character generally, owing to their precipitous slopes and the dense growth of the scrub, brushwood, and timber with which they are clothed, from the crests of the highest peaks down to the bottom of the deepest ravines. To the explorer, when first attempting to penetrate these ranges, their aspect is most disheartening, owing to the difficulty in tracing any connected system of ridges on which to travel, without which progress is exceedingly slow and wearisome, the valleys (or gullies) being utterly impracticable when in a state of nature.

A very remarkable feature throughout these mountain systems, in so far as I am acquainted with them, is the entire absence of lakes or even small bodies of impounded water, beyond the mere water-holes which exist in the rivers and rivulets, while in most other mountain ranges, such, for instance, as North Wales, Westmoreland, Cumberland, the Highlands of Scotland, and the mountain districts of Ireland, and of Europe; in fact, generally where mountain ranges occur, it is common to find numerous lakes in greater or less areas, impounded at varying altitudes, whilst amid our mountains, the absence of such bodies of water is the rule.

In calling attention to this fact, it will scarcely be necessary for me to remark, that if our mountain chains had been the result of ordinary volcanic agency, as generally understood to operate, in the shape of forces, acting with greater or less activity at certain points, and along certain lines, rupturing and dislocating the superincumbent strata, with greater or less violence, we should naturally expect to find along the courses of such dislocations, and their intervening valleys, natural barriers to the passage of the spring and drainage waters, and from such a cause we should have lakes of greater or less extent and depth; and such not being found, it is difficult to reconcile the existence of our present system of mountain ranges, with any but very gentle and long-continued sources of action, which must have required ages before any remarkable change was effected, and the same causes may at this moment be in slow operation beneath our feet, without mankind being in the least conscious of any change for centuries to come; in fact, such an elevation would in all probability be due to chemical rather than to igneous

action. Any indication of further continuance of such gradual action would be most likely first made known to us by the derangement of the instruments in the Melbourne Observatory, in some sensible manner.

The glacial action which has been so influential in abraiding and scooping out the valleys of other countries, must in our case be omitted from the list of causes, for I have neither seen or heard of any indications of such action, in the existence of moraines, or other evidence of the former presence of glaciers. Nor do I think that the valleys and river courses generally, could have their present form and character, had such agencies been concerned in their excavation.

Having thus far touched upon the negative aspect of the question, I must ask you to follow me during a brief description of the physical features of the country from Sale westwards and northwards towards the Dividing Range, being a distance of from seventy to eighty miles, having Mount Wellington on the north-east, the Baw Baw on the south-west, Mount Useful near the centre, and the Bald Hills on the divide, being the extremity of the area proposed to be described.

From Sale westwards, for from twenty to thirty miles, extend the plains, consisting of agricultural and pastoral lands, watered by the rivers La Trobe, Thomson, and the Macalister. The waters of the La Trobe flowing through extensive morasses, reaching from the foot of Mount Baw Baw down to the Coast Lakes, a distance of about seventy miles. At from twenty to thirty miles distance from Sale, the plains terminate and the hilly country begins, the portion between the Thomson and the Macalister being much more broken and irregular than that between the Thomson and La Trobe. For a further distance of about thirty miles to Mount Useful, a long and continuous spur has been explored, with branch, and sub-branch spurs, to the right and left, interlacing to a considerable extent, but preserving a general direction with the decreasing elevation of the ground, from Mount Useful eastward.

It is not until we begin the last ascent on the flank of Mount Useful, that we are enabled to obtain a good view of the valleys of the Macalister, and its dividing spurs in the amphitheatre of the dividing range, of which Mounts Useful and Wellington form the outer points of the crescent, whilst from the summit of the former an extensive view is

afforded of the valleys of the Thomson and its tributaries, embayed in another crescent of which the Baw Baw forms the southern extremity.

From a more westerly station on Mount Useful, a view is afforded of the connecting saddle between the mount and the dividing range.

At a first glance from Mount Useful the impression left upon the mind is, that the mount forms the central point of two semicircular basins, in form like the double bow of the letter B; the outer points terminating in the Baw Baw, and Wellington, distant respectively about 12 miles and 20 miles, whilst along the centre of each semi-basin, several lines of densely timbered ranges extend, in the general direction of the open sides, and thence in a more or less connected manner, continuous with the wooded ranges covering the face of the country eastward, until in the far distance the open plains can be seen in brownish patches; and beyond, the waters of the shore lakes and the ocean.

The above impressions, whilst generally correct, are only partially so, for upon careful examination, it is found that the semicircular basins, or mountain enclosures, are irregular in outline, and interrupted in places by deep ravines and gorges; whilst the apparently isolated mountain chains, occupying the centre of the basins, are in reality, huge spurs connected with the main range, by saddles of greater or less elevation, with lateral and sub-lateral spurs branching from them, in the most erratic manner, the only appearance of order being the general tendency of direction towards the lower country of the plains. Mount Useful itself is but a huge peak on a main spur from the dividing range, whilst the Baw Baw and Mount Wellington are terminal peaks, which rapidly run out into main spurs, from which leading and subsidiary spurs ramify, and ultimately terminate on the plains.

From Mount Useful huge spurs are thrown out on three sides, the chief one extending south westerly (dividing the waters of the Thomson and the Macalister Rivers), down to the plains, with its ramification of branch, sub, and sub-sub-branch spurs, and forks; forming a complete network, and yet preserving a general direction downwards to the plains.

From the Bald Hills on the divide, a huge spur is thrown out with very large branch, and sub-branch spurs, interlacing with each other, and with those thrown out from Mount Useful on the one side, and the Baw Baw on the

other, but still maintaining a general direction of south east, until it terminates from 12 to 14 miles south-east of the summits of the Baw Baw. This spur divides the waters of the Aberfeldy from the Jordan, and afterwards from the Thomson, until the junction of the first and last named rivers.

Throughout the whole of these spurs the general character of the rocks is clay, micaceous, and schistose slates, standing in planes of stratification at gradually increasing angles, until at the mount they are nearly vertical against an outcrop of granite* on the summit of the mount.

The strata around the foot of Mount Wellington I have had no opportunity of inspecting, and have only once passed over a slight portion of the eastern spurs of the Baw Baw; but from the outcrop of white rocks on its summit (supposed to be granite) and from the general aspects of both mountains, I believe it is quite safe for the general purposes of this paper, to assume that their geological characteristics are similar to those of Mount Useful.

After a consideration of the above facts, I believe that sufficient ground is afforded for concluding that the ridges and sub-ridges from the plains up to the divide, may be due to the upheaval of the granite from below (combined with chemical action as before alluded to), and, for the reasons before given, such upheaval has been very gradual during this period, the higher peaks have rendered the process of disintegration and denudation, by the frosts and rains much more rapid, owing to the gradually breaking up of the continuity of the crust over the summits, whilst the former gentle hollows, of the undulating country between the peaks of the ridges of the divide, would gradually be eroded into deep channels by the winter floods, each having a general tendency towards the lower levels of the plains, but, influenced by natural or accidental obstructions, interlacing and working themselves into the winding channels, such as we now find in the gullies and ravines of the district.

As this process went on, the erosion of the gullies and high

* The outcrop, which the author, in a cursory inspection, mistook for bleached granite, proves to be quartz conglomerate.

After the reading of this paper, Mr. Ligar, the Surveyor-General, quoted a general opinion of Mr. Selwyn, that a vast plateau of tertiary, crowned with basalt, had once extended above the level of our mountain ranges up to Mount Kosciusko, of which traces yet exist on Mount Useful, and that this fact was strongly in favour of the views expressed in this paper.—T. E. R.

table lands, would proceed with accelerated speed, from the growth of vegetation, and the storms bursting and breaking down large masses of materials from the steep sides of the newly formed ravines, each mass, in turn, assisting to destroy not only itself, but the other materials obstructing it in its course.

In the earlier ages of such a period as that which we have been contemplating, the flat coast known as the Ninety-Mile Beach, and the coast lakes, with their surrounding low lying land, could have no existence, whilst the waters of the ocean would roll unchecked, up the long narrow valley of the La Trobe, now occupied by rich alluvial marsh lands and back waters, and in all probability the marshes of the Morewell and the Moe, south of the La Trobe would be brackish, if not sea-water lakes.

The material worn out from the former undulating high lands of the ranges, would be sufficient to reclaim the whole of the La Trobe Valley and form the low lands around the Coast lakes—together with the Ninety Mile Beach.

Such are the views I have formed from the examination of the physical features of the district, and although such examination has been of necessity a very cursory one, I believe the views put forward will be found to be supported by a more careful scrutiny of facts.

This paper is in itself somewhat crude, from the want of time for preparation, but such as it is, I hope it will be accepted rather as suggestive of a question of great interest, which deserves a fuller examination and profounder thought than I have been able to afford to it.

ART. III—*On the Skeleton of the Gorilla.* By GEORGE B. HALFORD, M.D., Professor of Anatomy, Melbourne University.

[Read 24th July, 1865.]

Owing to the energy of Professor M'Coy, Melbourne has been enriched by the acquisition of skeletons and stuffed specimens of the Gorilla; and we are further indebted to him for permitting one of the former to illustrate our discussion this evening. It would not be right were I, comparatively speaking a new arrival, to allow this opportunity to pass without expressing the admiration with which